Overview of the Training Course...

Training Course...

- Handbook
- Website
- Poster
- Nuclides.net
- Test
- Laboratory Visits
- Certificate
- CD
- Nuclide Explorer

Overview of the Training Course...

Course Handbook

Nuclides.net: An Integrated Environment for Computations on Radionuclides and their Radiation, Springer Verlag 2003

Overview of the Training Course...

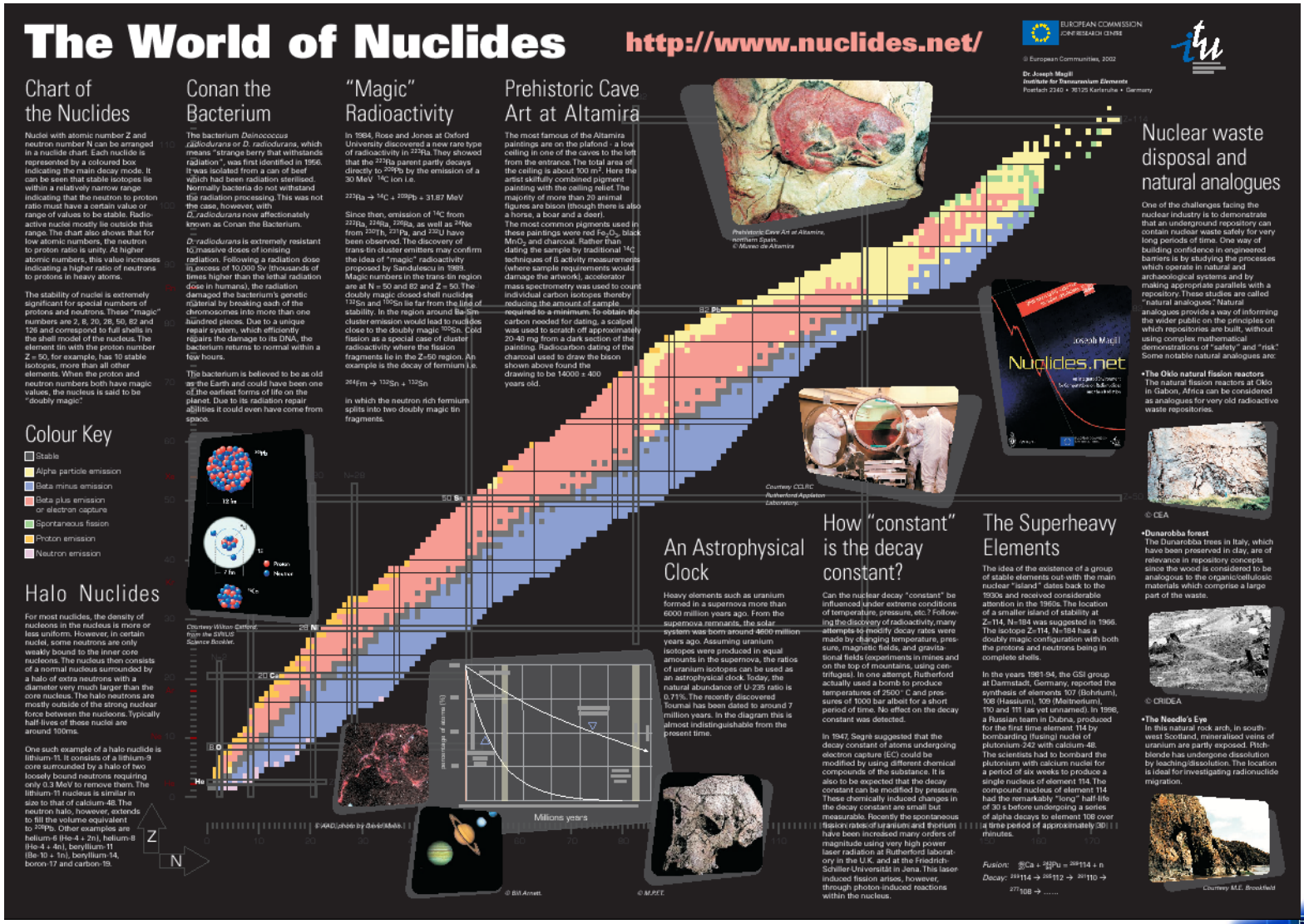
Nuclides.net website:

www.nuclides.net

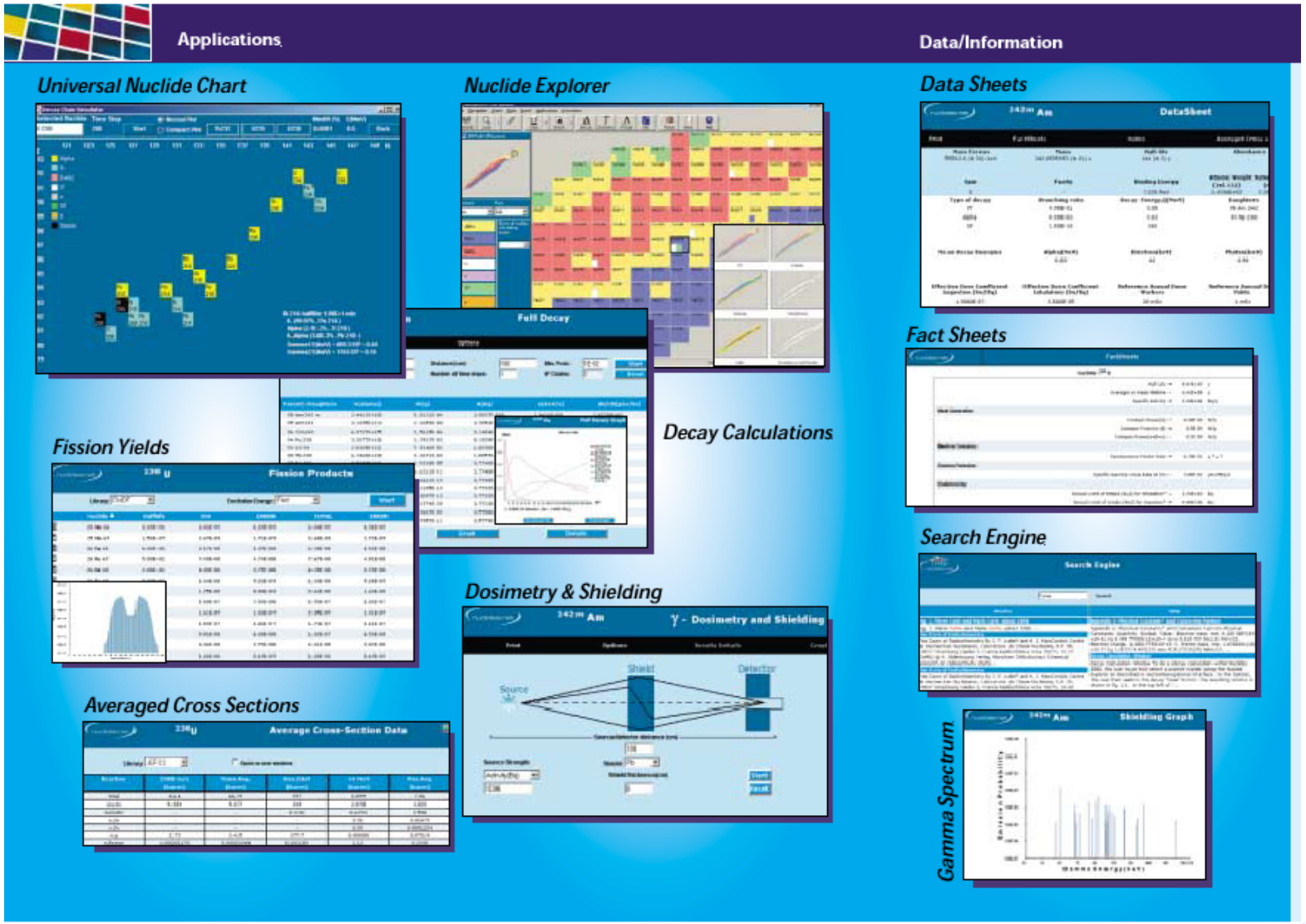
EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

Overview of the Training Course...

Joint Research Centre



Overview of the Training Course...



nuclides.net

Overview of the Training Course...

Test.....

Radioactivity, Radionuclides & Radiation - Computer-based Training Courses with Nuclides.net
(18-19th Sept, and 23-24th Oct. 2003)

Training Course Test

DataSheets

1. Calculate the energy released (i.e. the decay energy or Q-value) in the spontaneous transformation of Po-210 to Pb-206 by alpha emission.
2. Calculate the average alpha particle energy for the spontaneous transformation of Po-210 to Pb-206.
3. Calculate the maximum kinetic energy of the betas released in the spontaneous transformation of Sr-89 to Y-89. What is the average beta kinetic energy? Note that the average kinetic energy is approximately 1/3 of the max. value.
4. Calculate the energy released in the spontaneous transformation of Na-22 to Ne-22.

Decay Engine

5. The activity of Sr-90 is 18,000 transformations per minute. What is the mass of Sr-90?
6. What is the time required for the activity of Na-24 to diminish to 1% of its initial value?
7. What mass of Ra-226 will yield the same activity as one gram of Po-210?
8. What initial mass of F-18 is required in order that there are 3 mg remaining after 16 hours?
9. At t=0, there are 10 Ci of Sr-90 alone. What will be the activity of Y-90 after 5 years?
10. At t=0, there are 10 Ci of Ra-226 alone. What will be the activity of Rn-222 after 2 days?

Virtual Nuclides

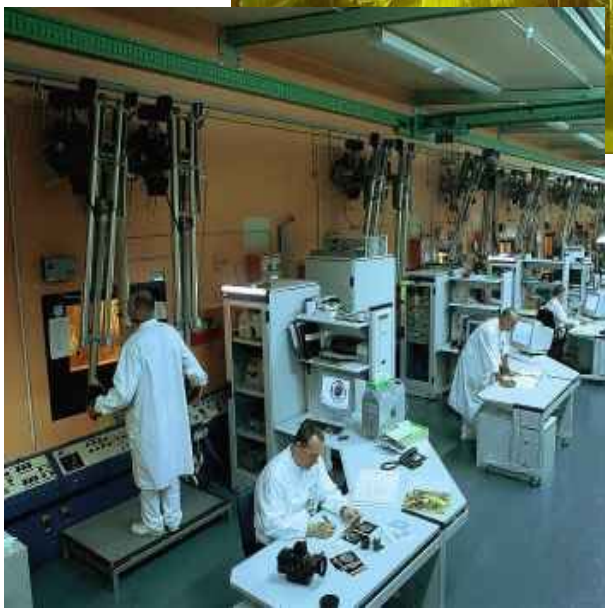
11. Ra-226 transforms to Rn-222. At t=0, there is one gram of Ra-226 and 1 mg of Rn-222. What will be the activity in Ci of Rn-222 after 7 days?

Dosimetry and Shielding

12. What is the gamma dose rate at 1 m due to a 1 Ci un-collimated isotropic source of I-131?
13. Calculate the approximate dose rate at a distance of 2m from a 240 MBq cobalt-60 source.
14. Calculate the activity of a Na-22 source which gives a dose rate of 64 µSv/h at 1m.
15. The dose rate to a valve is 160 µSv/h. If this is due to cobalt-60 inside the valve, how much lead shielding must be placed around the valve to reduce the dose rate to 10µSv/h?
16. A cobalt-60 source gives a dose rate of 400µSv/h at 1m. At what distance from the source must a barrier be placed if the dose rate at the barrier must not exceed 25µSv/h? What thickness of lead would give the same protection at the original distance?

Overview of the Training Course...

Visit to the Labs.....



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Training Course Certificate....

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Joint Research Centre

CERTIFICATE

We hereby certify that the beneath mentioned person has participated successfully in the

Radioactivity, Radionuclides, and Radiation

- A Multi-Media Training Course with

Nuclides.net

Institute for Transuranium Elements
Karlsruhe, Germany
23 - 24 October 2003

Ms. Barbara Vokal
Slovenia

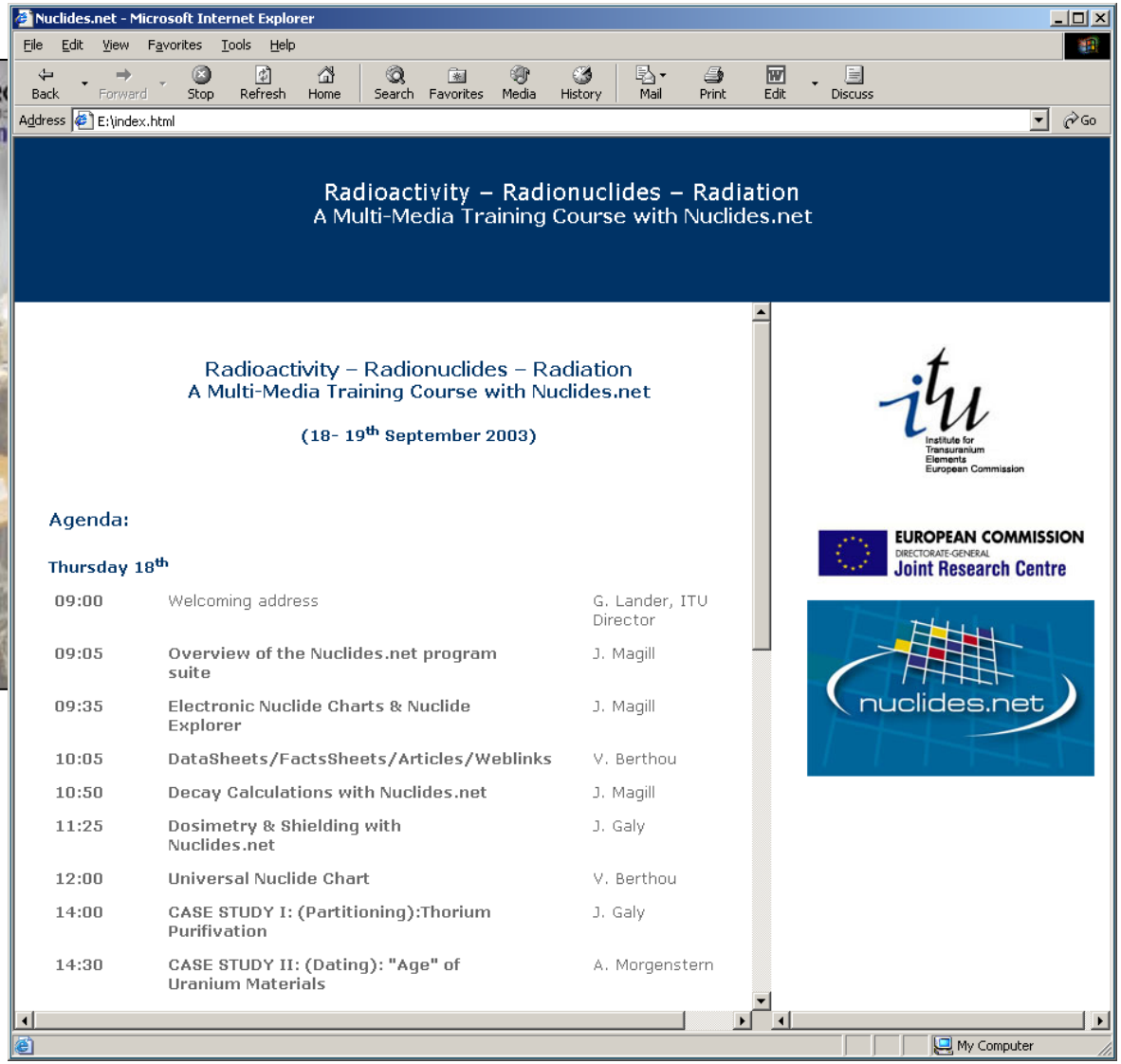
- Nuclide Charts and Nuclide Explorer
- Data sheets
- Decay calculations
- Dosimetry and Shielding
- Fission products Yields
- Cross-sections
- Case Studies

nuclides.net

For ITU:
J. Magill

Overview of the Training Course...

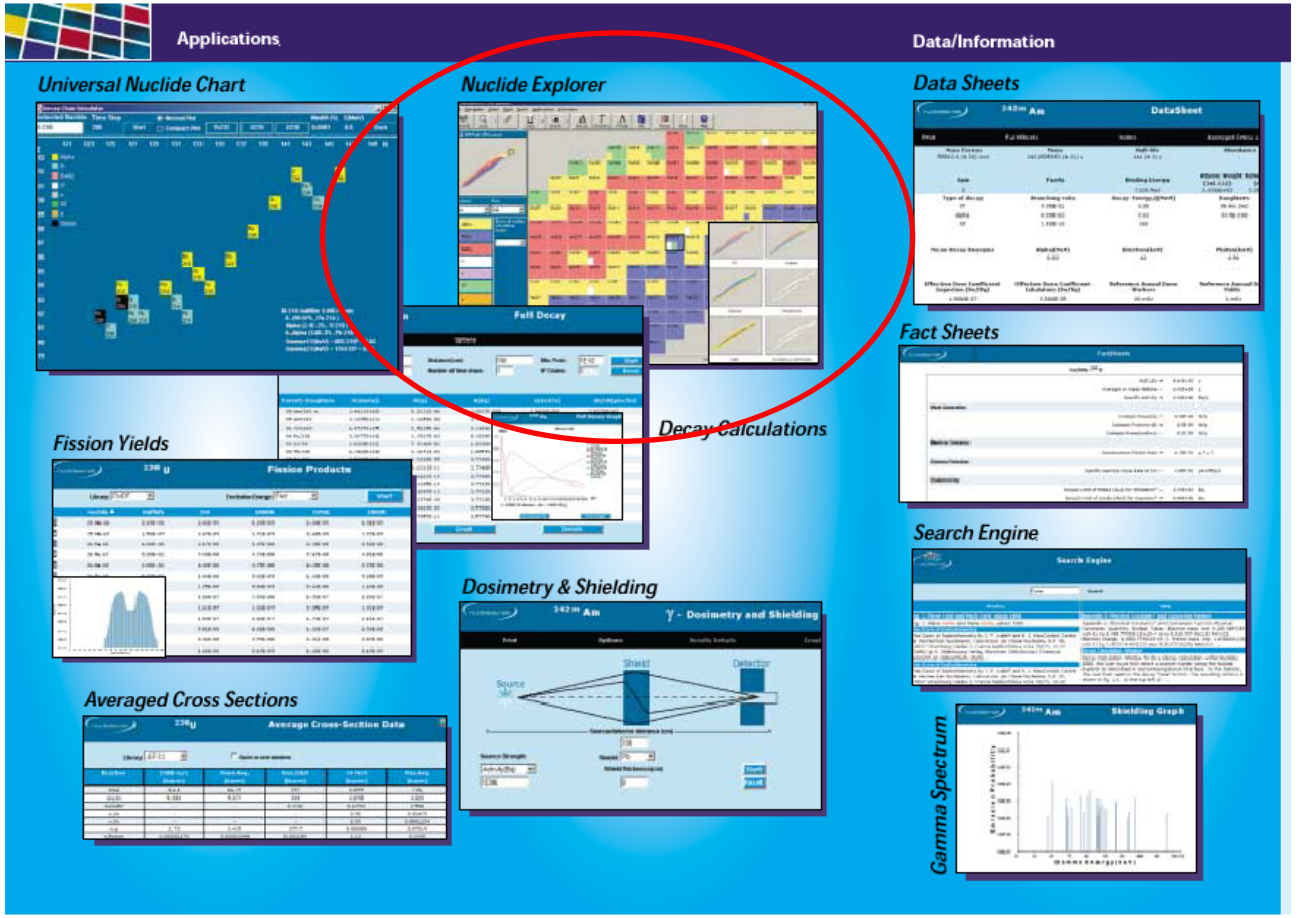
The CD.....



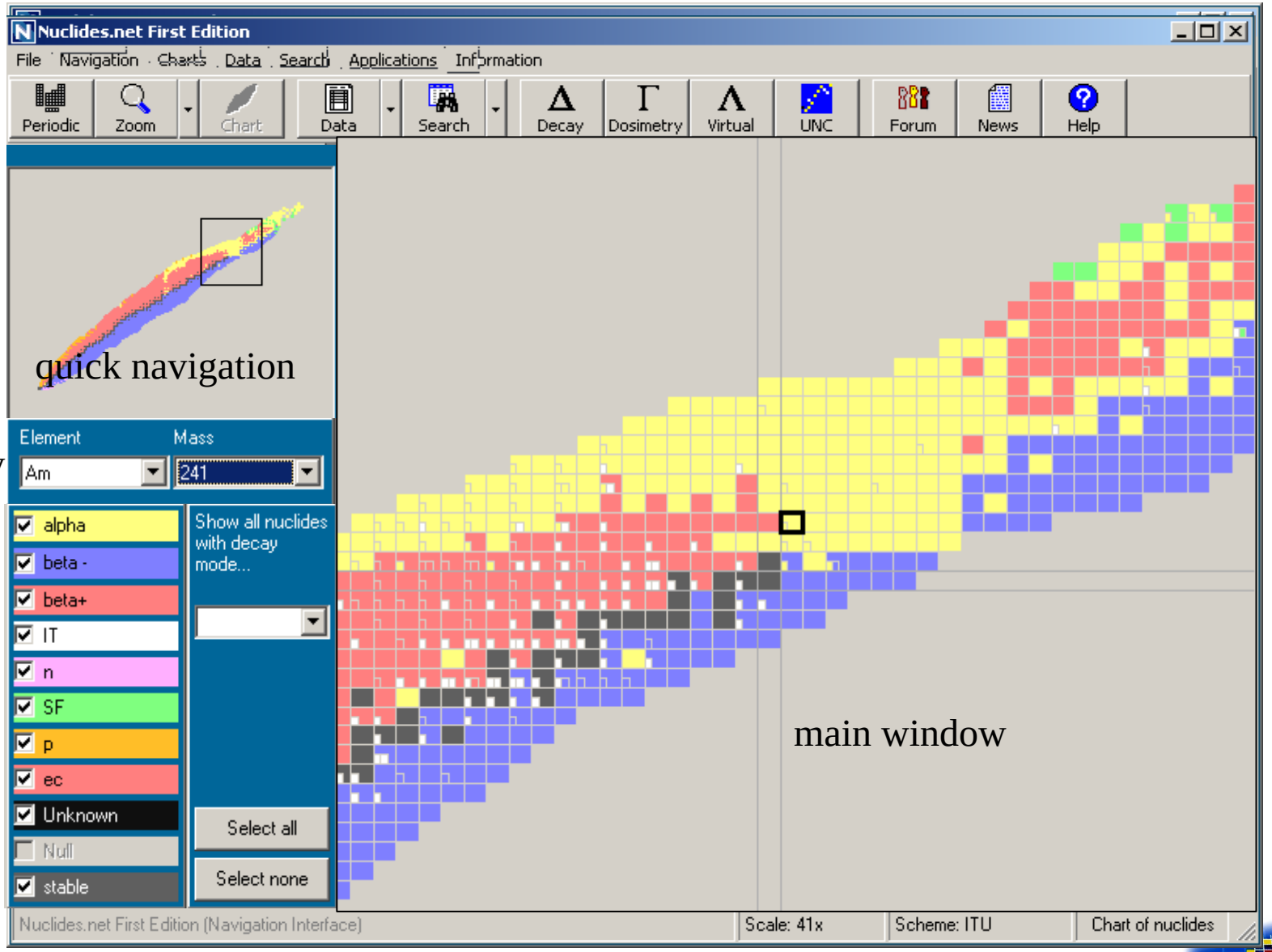
Overview of the Training Course...

Nuclide Explorer.....

- User Interface
- Zoom
- Charts
- Colour scheme (main decay modes)
- Colour scheme (all decay modes)
- Property filter
- Build your own chart

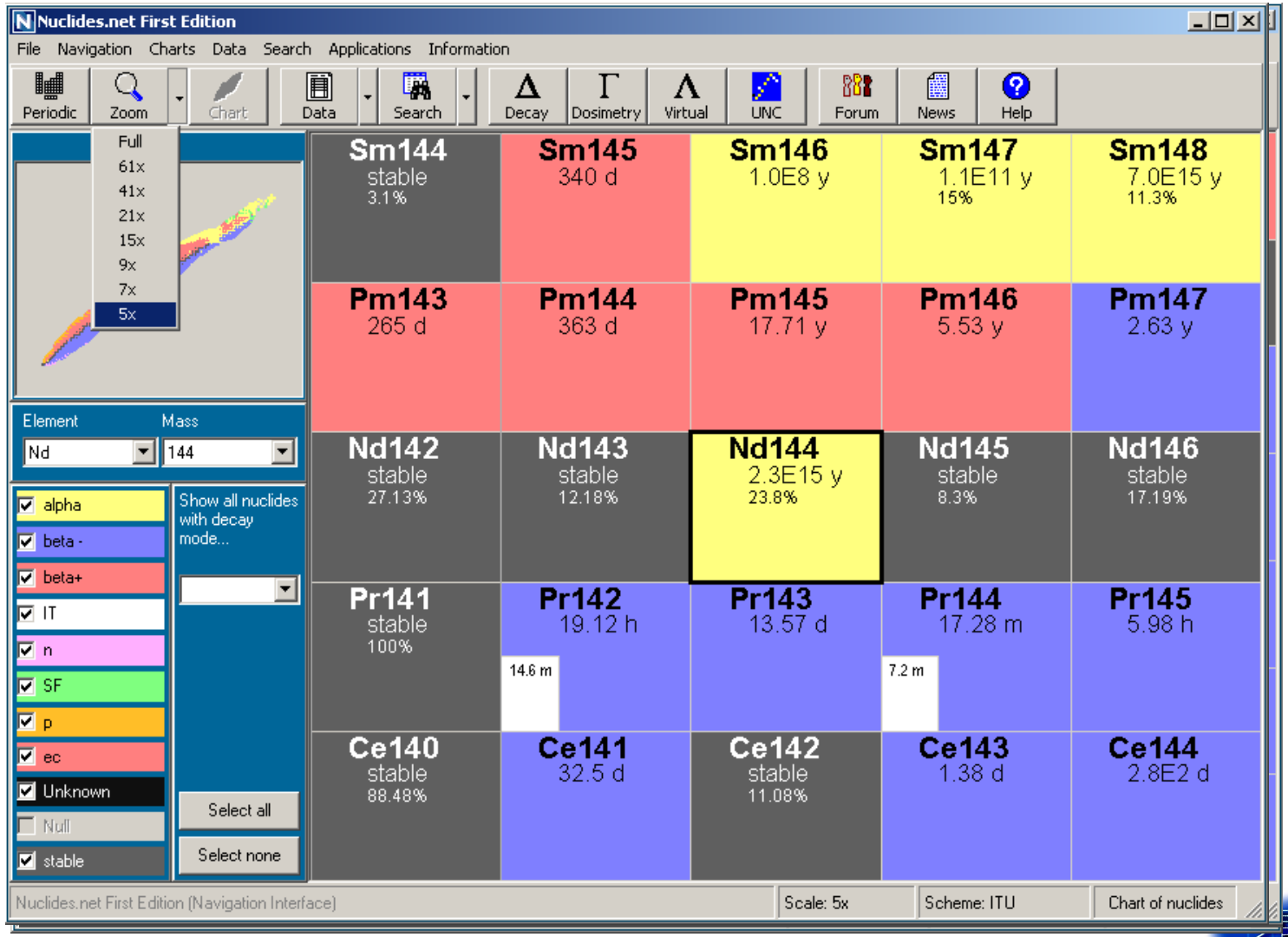


Overview of the Training Course...



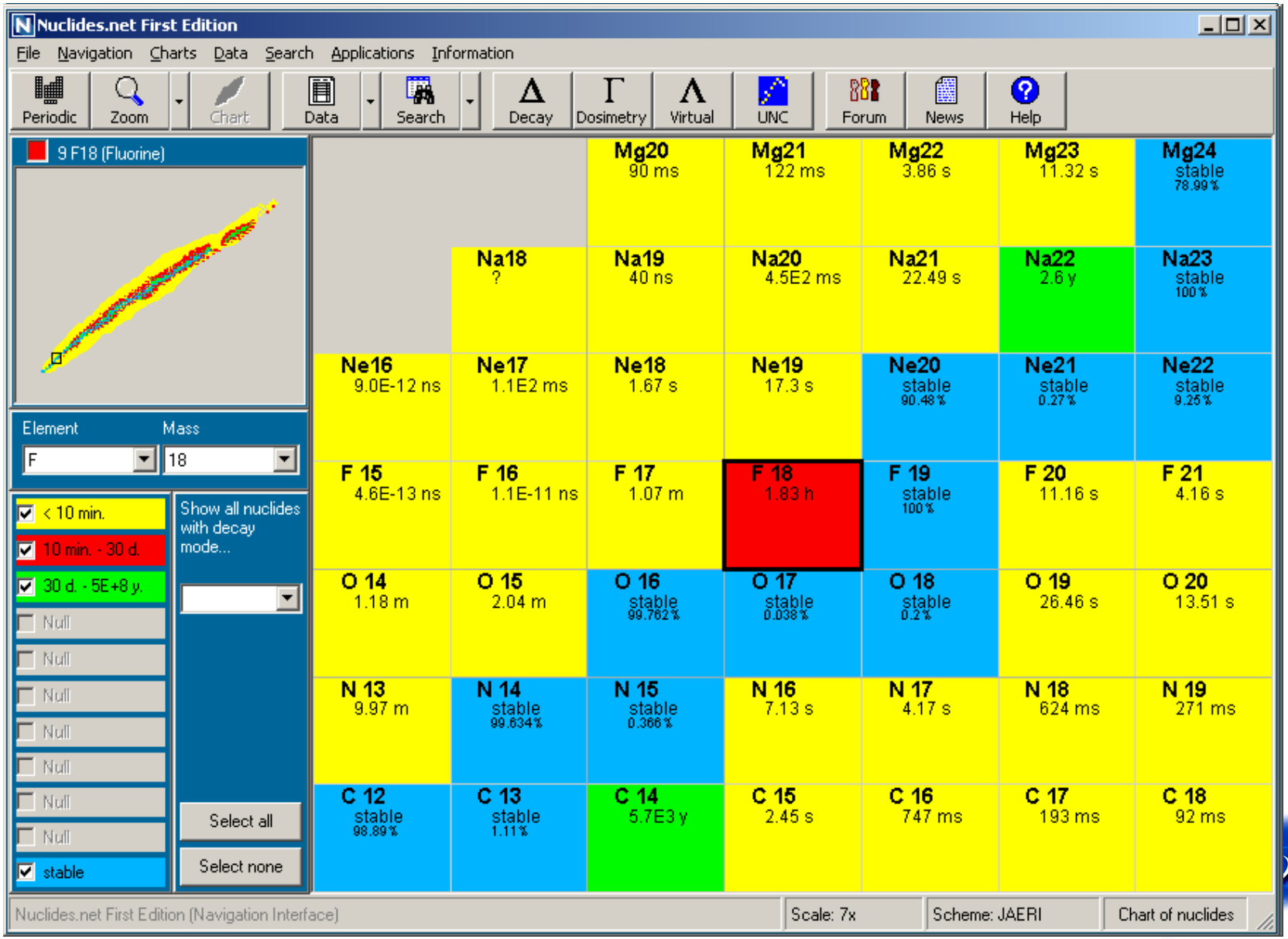
Overview of the Training Course...

Zoom also with the +- keys in the keypad or ↑↓ on the keyboard



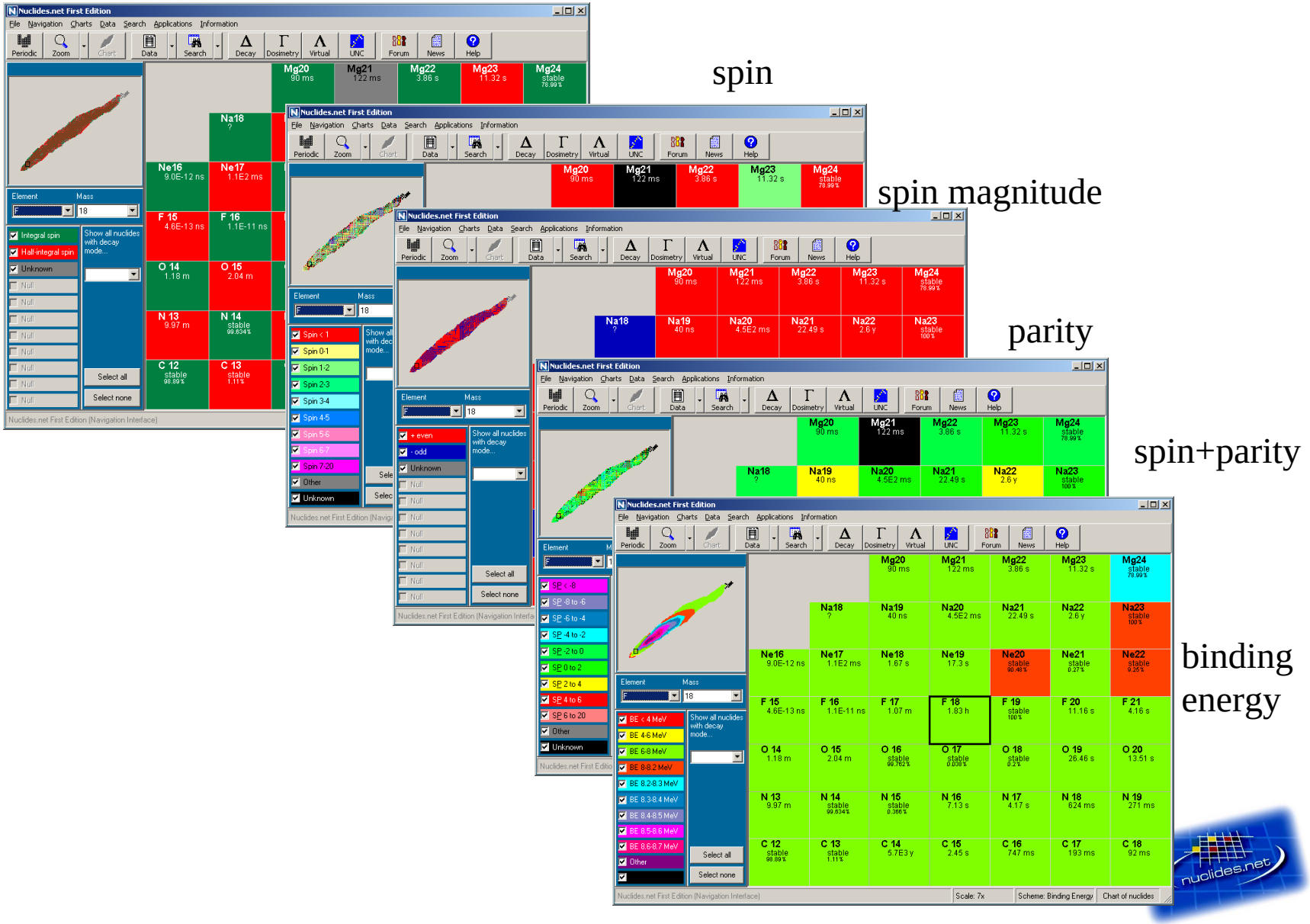
Overview of the Training Course...

Charts.....



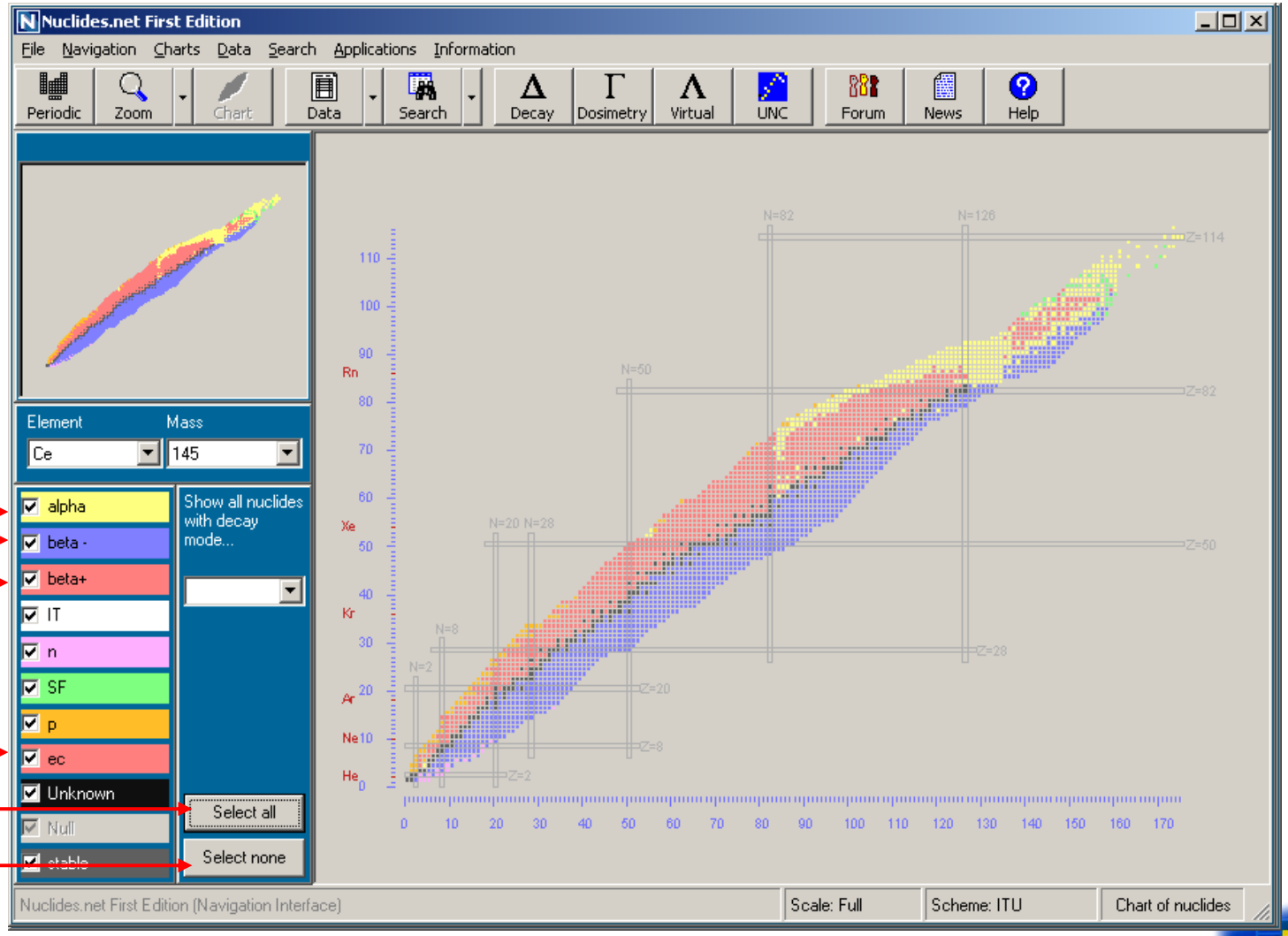
Overview of the Training Course...

Charts cont.....



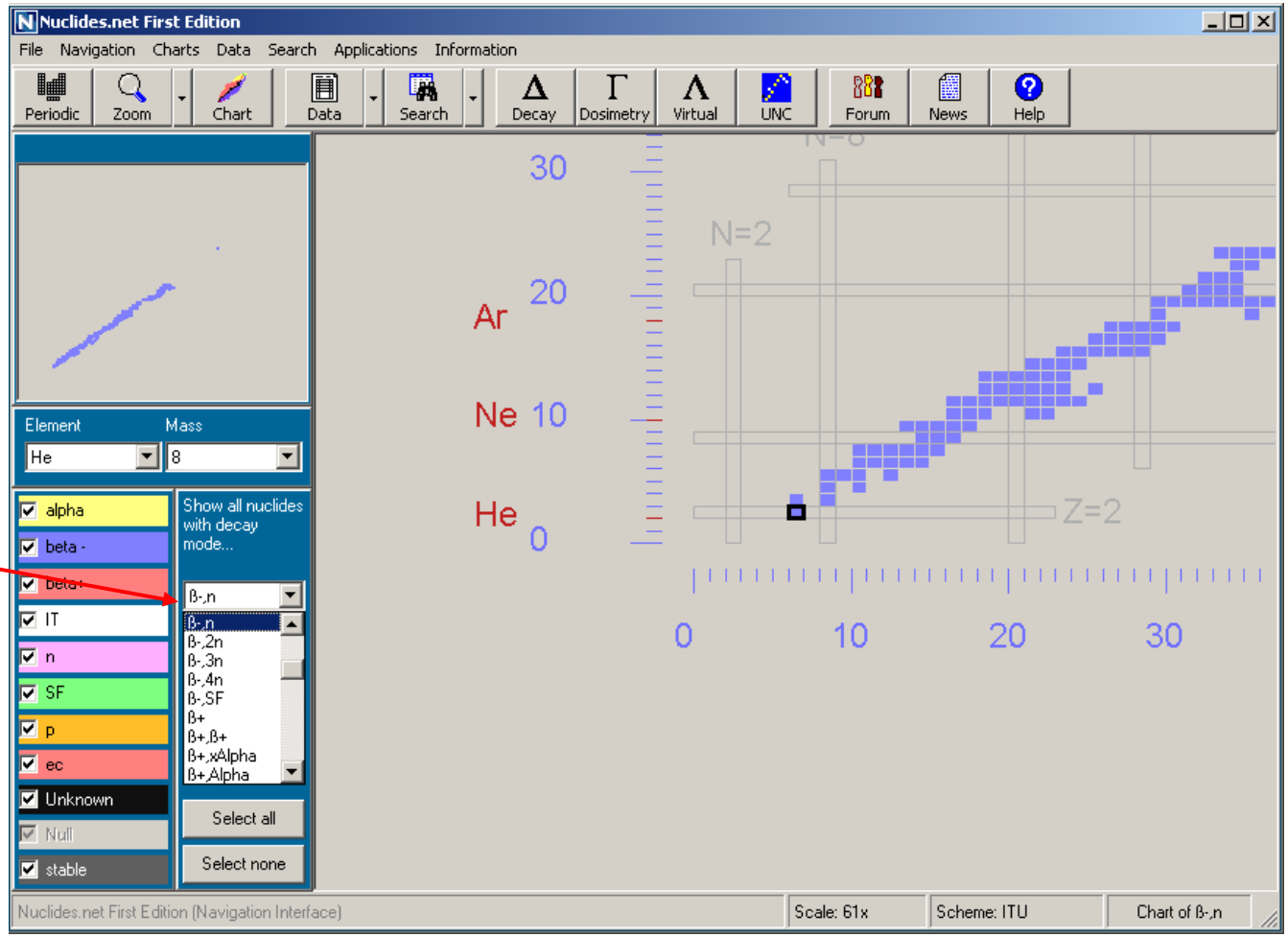
Overview of the Training Course...

Decay modes: Colours shown refer to the main decay only



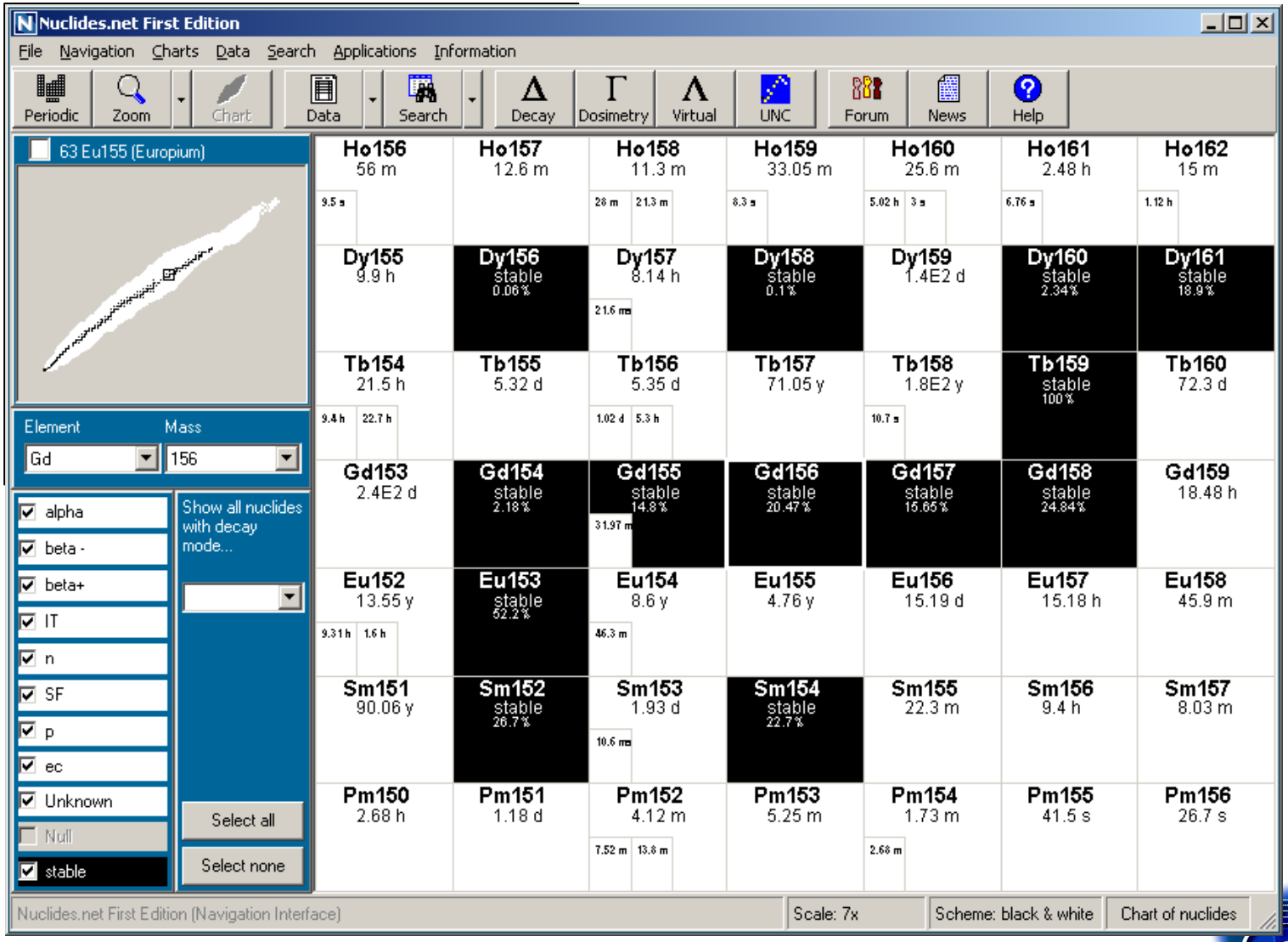
Overview of the Training Course...

Show all nuclides with decay mode...

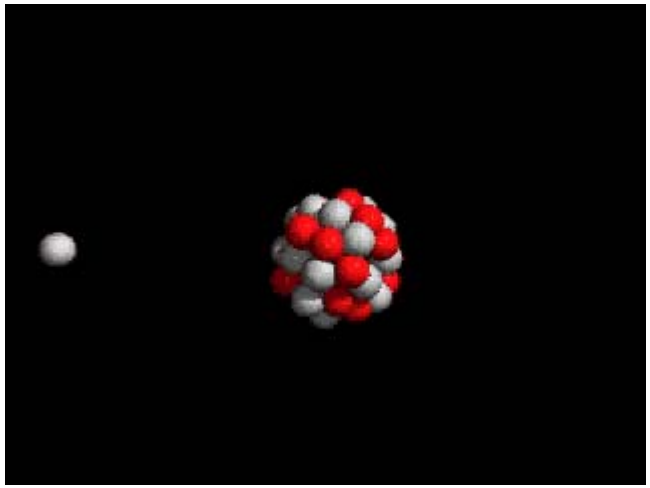


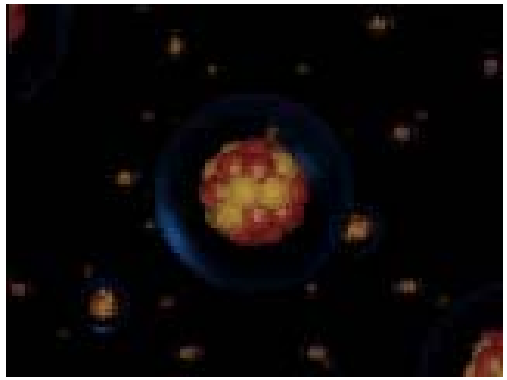
Overview of the Training Course...

Build your own nuclide charts....



Overview of the Training Course...





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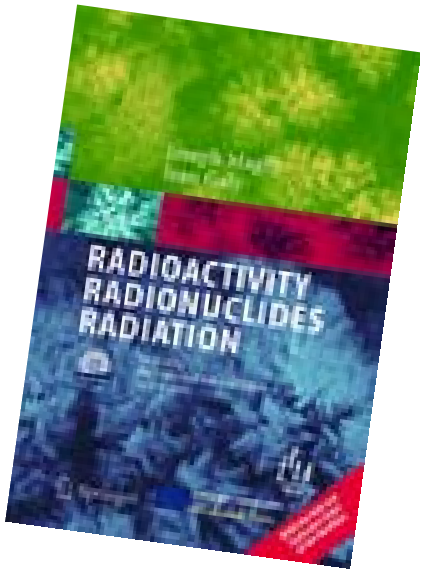
Overview of the Training Course...

New Book.. Springer Verlag 2004

RADIOACTIVITY – RADIONUCLIDES – RADIATION is suitable for a general audience interested in topical environmental and human health radiological issues such as radiation exposure in aircraft, food sterilisation, nuclear medicine, radon gas, radiation dispersion devices ("dirty bombs")… It leads the interested reader through the three Rs of nuclear science, to the forefront of research and developments in the field. The book is also suitable for students and professionals in the related disciplines of nuclear and radiochemistry, health physics, environmental sciences, nuclear and astrophysics. Recent developments in the areas of exotic decay modes (bound beta decay of 'bare' or fully ionized nuclei), laser transmutation, nuclear forensics, radiation hormesis and the LNT hypothesis are covered. Atomic mass data for over 3000 nuclides from the most recent (2003) evaluation are included. The book contains a CD-ROM with the Universal Nuclide Chart – an interactive, platform independent JAVA-program for displaying basic nuclear data, decay processes and neutron reactions together with a fold-out version of the most recent Karlsruhe Chart of the Nuclides.



Overview of the Training Course...

About the Training Course

The course will be on the use of Nuclides.net, a new software product from ITU, for training purposes in the nuclear industry, health physics and radiation protection, nuclear and radiochemistry.

Nuclides.net is an integrated environment for computations on radionuclides and their radiation. The "integrated environment" is a suite of computer programs ranging from a powerful user-friendly interface, which allows the user to navigate the nuclide chart and explore the properties of nuclides, to various computational modules for decay calculations, dosimetry and shielding calculations, etc.

The course will cover the basic properties of nuclides, isotopes and radiation, and introduces the participants to decay calculations, radiation dosimetry and shielding calculations, etc.

About ITU

The Institute for Transuranium Elements (ITU) is part of the Joint Research Centre (JRC) of the European Commission. The function of the JRC is to serve as a reference centre of science and technology for the European Union. The mission of ITU is to protect the European citizen against risks associated with the handling and storage of highly radioactive elements. ITU's prime objectives are to serve as a centre for basic actinide research, to contribute to an effective safety and safeguards system for the nuclear fuel cycle, and to study technological and medical applications of transuranium elements.

For more information on ITU, check the latest Activity Reports at the ITU web site:
http://itu.jrc.cec.eu.int/

Radioactivity, Radionuclides & Radiation

A computer-based training course with Nuclides.net

Karlsruhe • Germany

Overview of the Training Course...

Programme and Topics

- Background on Radioactivity
- Nuclide Charts and the Nuclide Explorer
- Universal Nuclide Chart*
- Data sheets
- Decay calculations
- Dosimetry and shielding
- Nuclide mixture
- Fission products and yields
- Cross-sections
- Installation of Nuclides.net
- Overview of Nuclides.net program suite
- Case studies
- Special topics

* The Universal Nuclide Chart and Radioactive Decay Applet in Nuclides.net has been recommended as a high quality internet resource in the physical sciences by

PSIgate

PSIgate (Physical Sciences Information Gateway) is the physical sciences hub of the Resource Discovery Network

Karlsruhe

For more information about Karlsruhe, see
www.karlsruhe.de

Registration

The course is suitable for participants who come from the nuclear industry, nuclear research organisations, universities, regulatory authorities or nuclear medicine institutes.

Basic knowledge on the physics and chemistry of radionuclides, radioactivity and radiation is required. The course will be held in English.

The completed application form should be sent to Dr. Jean Galy. Please note that there is a limited number of participants in each course.

Costs

Details on the course fees can be obtained from Dr. Jean Galy (see under Contacts).

For the new and future countries of EU, a budget exists to support their participation for accommodation, transport and course fees.

Hotel Reservation

A block booking for hotels in Karlsruhe will be made.
A bus will fetch the participants at their hotel to go to ITU.

Web Link

For further information on the Nuclides.net software:
http://www.nuclides.net/

Contacts

Scientific & Organisational matters

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Overview of the Training Course...

Nuclides.net
Mission Statement….

Our job is to continuously extend and improve the software modules and optimize the Nuclides.net software environment so that scientists can concentrate on the results